GPS INSTRUMENT DEVELOPMENT AT JPL; CURRENT AND FUTURE RECEIVER CONCEPTS FOR HIGH ACCURACY MEASUREMENTS

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The National Aeronautics and Space Administration (NASA) is undertaking many projects that require high accuracy and high precision Global Positioning System (GPS) data. These include geodetic measurements of crustal dynamics, orbit determination for Earth satellites, time synchronization and ionospheric calibration to support deep space navigation, atmospheric pressure and temperature modeling using atmospheric occultations and attitude determinations for dynamic platforms. The Jet Propulsion Laboratory designed the TurboRogue GPS receiver to support field applications such as rapid static surveying, unattended operation in continuous arrays, and high-rate, high dynamic tracking of signals refracted by the Earth's atmosphere and ionosphere. A description of the TurboRogue design, emphasizing approaches to improve codeless tracking capabilities and to reduce multipath errors as well as ongoing development efforts will be presented.